

REMARKS/ARGUMENTS

Claims 1-3 and 5-9 remain in this application. Claim 1 has been amended.

Applicant is confused by the Examiner's assertion that claims 5, 8, and 9 have been withdrawn from further consideration, as being drawn to a nonelected species.

Claims 5, 8, and 9 were not included in the restriction requirement dated 6/30/2005 and indeed were classified as generic by the Examiner at that time. Claims 5, 8, and 9 are not part of, nor dependent upon, the nonelected species. Therefore, Applicant did not recommend any disposition with respect to claims 5, 8, and 9, nor had Applicant been requested to do so. Thus, they remain identified as original claims in this response, and Applicant requests that they continue to be given consideration, especially since Applicant believes that claim 1 (as amended), from which claims 5, 8, and 9 are dependent, is now in condition for allowance.

Claim 4 has been withdrawn as a result of the restriction requirement with the understanding that, if a generic or linking claim is held allowable, then Applicant shall be entitled to consideration of claim 4. Also, in view of the Examiner's earlier restriction requirement and depending on the results of the prosecution of this application, Applicant reserves the right to present claim 4 in a divisional application.

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding office action is respectfully requested.

1. Specification

In the specification, the section heading **Detailed Description of the Invention** was added above paragraph [0021] as requested by the Examiner.

2. § 102 Rejections

The Examiner has rejected claims 1-3 and 6-7 under 35 U.S.C. § 102(b) as being anticipated by Wang et al., in their publication "Bandpass Traveling-Wave Mach-Zehnder Modulator in LiNbO₃ with Domain Reversal".

First, the device of the Wang reference is operable over a narrow bandwidth, as described several times in the reference; for example, in the Abstract and in Fig. 3, the

modulator has a 15 GHz-broad bandpass response centered at 25 GHz. Since microwave frequency covers a range from 1 GHz to 300 GHz, the device of the Wang reference is applicable to a very narrow bandwidth in the microwave region. Second, as described on page 2, column 1, lines 35-40 and shown in Fig. 1, the Wang device provides a domain reversal “in the middle” of the device which is only operable within this narrow band centered at 25GHz in the microwave region. Also, on page 2, column 2, lines 35-42, the Wang reference acknowledges decreased modulation efficiency of their device at low frequencies due to the electro-optic phase shift induced by one uninverted section being cancelled by that of the inverted section. Inherent to this design and the placement of the domain reversal “in the middle” of the device, efficacy is limited to a narrow bandpass.

The present invention provides an active device in which the overall electro-optical response is operable over a broader bandwidth in the microwave region due to the division of the electro-optical material into three separate zones, and the placement of the domain reversal (discontinuity) in the downstream zone of the device. This results in phase velocity matching across a much broader bandwidth. The body of the electro-optically active material is such that the device operates in three successive zones: the upstream zone, the middle zone and the downstream zone. The upstream zone provides desirable phase change for all frequencies in the bandwidth. The middle zone provides desirable phase change for frequencies in the upper bandwidth, but phase change for the lower frequencies becomes excessive. The downstream zone provides no significant phase change in the higher frequencies but it reverses the excess change at lower frequencies. Having the electro-optical material divided into three separate zones, and having the discontinuity positioned within the device’s downstream zone provides a device which is operable over an increased bandwidth (down to the C band and D band where frequencies range from about 0.5GHz to about 2GHz) and which provides an improved combination of switching voltage and bandwidth.

Claim 1 has been amended to emphasize the position of the discontinuity within the downstream zone and also to further define the body of electro-optically active material as having three successive zones; an upstream zone, a middle zone, and a downstream zone, such as to maintain adequate phase velocity matching between optical

and microwave frequencies operable over a broad bandwidth in the microwave region.
Claim 1 is now clearly distinguishable over the Wang reference.

Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to Deposit Account 03-3325.

Please direct any questions or comments to the undersigned.

DATE: 1/12/06

Respectfully submitted,



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